CLAIMS:

1. An inverter apparatus for controlling the speed of an induction motor variably, comprising:

a detection unit for detecting an excitation current of said induction motor;

a setting unit for setting a limitation level of said excitation current;

a torque boost voltage command unit for producing a torque boost voltage command in response to a frequency command of said inverter apparatus; and

a torque boost voltage compensation unit for changing said torque boost voltage command so that said detected excitation current value is smaller than or equal to said limitation level.

2. An inverter apparatus according to Claim 1, wherein said torque boost voltage compensation unit includes a limiter processing unit and inverts said torque boost voltage command, said inverted torque boost voltage command being limiter-processed as a lower limiter value of said limiter processing unit to produce a compensation value of said torque boost voltage command.

3. An inverter apparatus according to Claim 1, wherein said excitation current detection unit uses an output voltage phase of said inverter apparatus to detect an equivalent of said excitation current by calculation based on said detected motor current value.

4. An inverter apparatus according to Claim 1,

wherein said excitation current detection unit uses an output voltage phase of said inverter apparatus to detect an equivalent of said excitation current by calculation based on a DC input current of said inverter apparatus.

5. An inverter apparatus according to Claim 1, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

6. An inverter apparatus according to Claim 1, wherein an inverter output voltage is controlled to be substantially constant after the time that a motor current (no-load current) reaches an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

7. An inverter apparatus according to Claim 2, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

8. An inverter apparatus according to Claim 2, wherein an inverter output voltage is controlled to be substantially constant after the time that a motor current (no-load current) reaches an approximate

excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

9. An inverter apparatus according to Claim 3, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

10. An inverter apparatus according to Claim 3, wherein an inverter output voltage is controlled to be substantially constant after the time that a motor current (no-load current) reaches an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

11. An inverter apparatus for controlling the speed of an induction motor variably, comprising:

detection means for detecting an excitation current of said induction motor;

setting means for setting a limitation level of said excitation current;

torque boost voltage command means for producing a torque boost voltage command in response to a frequency command of said inverter apparatus; and

torque boost voltage compensation means for changing said torque boost voltage command so that said detected excitation current value is smaller than or

equal to said limitation level.

12. An inverter apparatus according to Claim 11, wherein said torque boost voltage compensation means includes limiter processing means and inverts said torque boost voltage command, said inverted torque boost voltage command being limiter-processed as a lower limiter value of said limiter processing means to produce a compensation value of said torque boost voltage command.

13. An inverter apparatus according to Claim 11, wherein said excitation current detection means uses an output voltage phase of said inverter apparatus to detect an equivalent of said excitation current by calculation based on said detected motor current value.

14. An inverter apparatus according to Claim 11, wherein said excitation current detection means uses an output voltage phase of said inverter apparatus to detect an equivalent of said excitation current by calculation based of a DC input current of said inverter apparatus.

15. An inverter apparatus according to Claim 11, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

16. An inverter apparatus according to Claim 11, wherein an inverter output voltage is controlled to be

substantially constant after the time that a motor current (no-load current) reaches an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

17. An inverter apparatus according to Claim 12, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

18. An inverter apparatus according to Claim 12, wherein an inverter output voltage is controlled to be substantially constant after the time that a motor current (no-load current) reaches an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

19. An inverter apparatus according to Claim 13, wherein a motor current (no-load current) is limited to an approximate excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.

20. An inverter apparatus according to Claim 13, wherein an inverter output voltage is controlled to be substantially constant after the time that a motor current (no-load current) reaches an approximate

excitation current limitation level when said torque boost voltage command is increased gradually in the state that said induction motor is operated in no load.